Comparison Of Downscaled CMIP5 Precipitation Datasets For Projecting Changes In Extreme Precipitation In The San Francisco Bay Area.

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Water resource managers planning for the adaptation to future events of extreme precipitation now have access to high resolution downscaled daily projections derived from statistical bias correction and constructed analogs. We also show that along the Pacific Coast the Northern Oscillation Index (NOI) is a reliable predictor of storm likelihood, and therefore a predictor of seasonal precipitation totals and likelihood of extremely intense precipitation. Such time series can be used to project intensity duration curves into the future or input into stormwater models. However, few climate projection studies have explored the impact of the type of downscaling method used on the range and uncertainty of predictions for local flood protection studies.

Here we present a study of the future climate flood risk at NASA Ames Research Center, located in South Bay Area, by comparing the range of predictions in extreme precipitation events calculated from three sets of time series downscaled from CMIP5 data: 1) the Bias Correction Constructed Analogs method dataset downscaled to a 1/8 degree grid (12km); 2) the Bias Correction Spatial Disaggregation method downscaled to a 1km grid; 3) a statistical model of extreme daily precipitation events and projected NOI from CMIP5 models.

In addition, predicted years of extreme precipitation are used to estimate the risk of overtopping of the retention pond located on the site through simulations of the EPA SWMM hydrologic model. Preliminary results indicate that the intensity of extreme precipitation events is expected to increase and flood the NASA Ames retention pond. The results from these estimations will assist flood protection managers in planning for infrastructure adaptations.

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